

WHAT IS CLAIMED IS:

1 1. A nonaqueous electrolyte battery comprising a positive
2 electrode containing a positive electrode active material that is
3 capable of occluding and releasing lithium, a negative electrode
4 containing a main active material that is capable of occluding and
5 releasing lithium, and a current collector comprising copper,
6 wherein the negative electrode contains a subsidiary active
7 material for supplying lithium from the negative electrode to the
8 positive electrode at a condition of overdischarge, the subsidiary
9 active material supplying lithium to the positive electrode to
10 saturate lithium occluding at the positive electrode to reduce an
11 electrical potential of the positive electrode and terminate
12 discharge of the battery before an electrical potential of the
13 negative electrode reaches the electrical potential at which copper
14 is dissolved from the current collector.

1 2. The nonaqueous electrolyte battery according to claim 1,
2 wherein the main active material of the negative electrode is
3 carbon, and the subsidiary active material is an active material
4 that occludes and releases lithium at an electrical potential that
5 is a higher than an electrical potential at which the carbon

6 occludes and releases lithium and is lower than an electrical
7 potential at which copper is dissolved.

1 3. The nonaqueous electrolyte battery according to claim 1,
2 wherein the subsidiary active material is lithium titanate.

1 4. The nonaqueous electrolyte battery according to claim 2,
2 wherein the subsidiary active material is lithium titanate.

1 5. The nonaqueous electrolyte battery according to claim 3,
2 wherein the lithium titanate is at least one titanate selected from
3 the group consisting of Li_2TiO_3 , $\text{Li}_4\text{Ti}_5\text{O}_{12}$, $\text{Li}_4\text{Ti}_{11}\text{O}_{20}$ and $\text{Li}_2\text{Ti}_3\text{O}_7$.

1 6. The nonaqueous electrolyte battery according to claim 4,
2 wherein the lithium titanate is at least one titanate selected from
3 the group consisting of Li_2TiO_3 , $\text{Li}_4\text{Ti}_5\text{O}_{12}$, $\text{Li}_4\text{Ti}_{11}\text{O}_{20}$ and $\text{Li}_2\text{Ti}_3\text{O}_7$.

1 7. The nonaqueous electrolyte battery according to claim 3,
2 wherein a particle diameter of the lithium titanate is not greater
3 than 5 μm .

1 8. The nonaqueous electrolyte battery according to claim 4,

2 wherein a particle diameter of the lithium titanate is not greater
3 than 5 μm .

1 9. The nonaqueous electrolyte battery according to claim 5,
2 wherein a particle diameter of the lithium titanate is not greater
3 than 5 μm .

1 10. The nonaqueous electrolyte battery according to claim 6,
2 wherein a particle diameter of the lithium titanate is not greater
3 than 5 μm .

1 11. The nonaqueous electrolyte battery according to claim 1,
2 wherein an amount of lithium which is able of being occluded at an
3 initial charge is provided to the negative electrode in advance.

1 12. The nonaqueous electrolyte battery according to claim 11,
2 wherein the lithium is provided to the negative electrode in
3 advance by adhering lithium metal onto the negative electrode.

1 13. The nonaqueous electrolyte battery according to claim 1,
2 wherein a ratio of initial negative electrode charge capacity/
3 positive electrode capacity is in a range of 1.0 and 1.2.

1 14. The nonaqueous electrolyte battery according to claim 1,
2 wherein the subsidiary active material in terms of charge capacity,
3 is contained in the negative electrode, in an amount determined
4 from the following expression: (initial positive electrode charge
5 capacity x initial positive electrode charge/discharge
6 efficiency/100) - {initial positive electrode charge capacity -
7 (initial negative electrode charge capacity x (100 - initial
8 negative electrode charge/discharge efficiency/100))}.

1 15. The nonaqueous electrolyte battery according to claim 1,
2 wherein the positive electrode active material is an active
3 material having a discharge capacity of not greater than 5mAh/g at
4 an electrical potential of 3.7 ~ 3.1 V measured using lithium as a
5 counter electrode.

1 16. The nonaqueous electrolyte battery according to claim 1,
2 wherein the positive electrode active material is lithium cobalt
3 oxide or lithium manganate.